

CLAIMS

1. A negative-resistance circuit comprising:
a transistor;
a plurality of distributed constant lines respectively connected
to three terminals of said transistors; and
5 an inductance element connected between an output terminal
of said negative-resistance circuit and a ground potential for adjusting a
negative resistance value.
2. The negative-resistance circuit according to claim 1, wherein:
said inductance element comprises a distributed constant line
shorter than one-quarter wavelength at a desired frequency for connecting
between a signal conductor and the ground potential.
- 5 3. The negative-resistance circuit according to claim 1, wherein:
said distributed constant line is a coplanar type one composed
of a signal conductor and ground conductors disposed to sandwich said
signal conductor with predetermined gaps therebetween, and
10 said inductance element comprises a conductor piece which
traverses only one of said gaps to connect said signal conductor with said
ground conductor.
4. A negative-resistance circuit comprising:
a transistor;
a plurality of distributed constant lines respectively connected
to three terminals of said transistors; and

5 a capacitance element connected between an output terminal of said negative-resistance circuit and a ground potential for adjusting a negative resistance value.

5. The negative-resistance circuit according to claim 4, wherein:
 said capacitance element comprises a distributed constant line which is branched from a signal conductor, has an opened leading end, and is shorter than one-quarter wavelength at a desired frequency.

5 6. The negative-resistance circuit according to claim 4, wherein:
 said distributed constant line is a coplanar type one composed of a signal conductor and ground conductors disposed to sandwich said signal conductor with predetermined gaps therebetween, and
5 said capacitance element comprises a conductor piece which is branched from said signal conductor and has an opened leading end.

7. The negative-resistance circuit according to claim 1, wherein a plurality of distributed constant lines are connected in parallel to at least one of the three terminals of said transistor.

8. The negative-resistance circuit according to claim 4, wherein a plurality of distributed constant lines are connected in parallel to at least one of the three terminals of said transistor.

9. A negative-resistance circuit comprising:
 a transistor;

a plurality of distributed constant lines respectively connected to three terminals of said transistor; and

5 a plurality of distributed constant lines connected in parallel to at least one of the three terminals of said transistor.

10. The negative-resistance circuit according to claim 7, wherein:
one of said plurality of distributed constant lines connected in parallel is a distributed constant line which is longer than one-quarter wavelength and shorter than one-half wavelength at a desired frequency,
5 and has a leading end connected to a ground potential.

11. The negative-resistance circuit according to claim 7, wherein:
one of said plurality of distributed constant lines connected in parallel is a distributed constant line which is shorter than one-quarter wavelength at a desired frequency, and has an opened leading end, and
5 the remaining distributed constant lines are distributed constant lines each having a leading end short-circuited to a ground potential.

12. The negative-resistance circuit according to claim 8, wherein:
one of said plurality of distributed constant lines connected in parallel is a distributed constant line which is longer than one-quarter wavelength and shorter than one-half wavelength at a desired frequency,
5 and has a leading end connected to a ground potential.

13. The negative-resistance circuit according to claim 8, wherein:
one of said plurality of distributed constant lines connected in

parallel is a distributed constant line which is shorter than one-quarter wavelength at a desired frequency, and has an opened leading end, and
5 the remaining distributed constant lines are distributed constant lines each having a leading end short-circuited to a ground potential.

14. The negative-resistance circuit according to claim 9, wherein:
one of said plurality of distributed constant lines connected in parallel is a distributed constant line which is longer than one-quarter wavelength and shorter than one-half wavelength at a desired frequency,
5 and has a leading end connected to a ground potential.

15. The negative-resistance circuit according to claim 9, wherein:
one of said plurality of distributed constant lines connected in parallel is a distributed constant line which is shorter than one-quarter wavelength at a desired frequency, and has an opened leading end, and
5 the remaining distributed constant lines are distributed constant lines each having a leading end short-circuited to a ground potential.

16. The negative-resistance circuit according to claim 7, wherein:
said transistor is a field effect transistor, and
said terminal to which said plurality of distributed constant lines are connected in parallel is a source of said field effect transistor.

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17. The negative-resistance circuit according to claim 8, wherein:
said transistor is a field effect transistor, and
said terminal to which said plurality of distributed constant lines

are connected in parallel is a source of said field effect transistor.

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18. The negative-resistance circuit according to claim 9, wherein:
said transistor is a field effect transistor, and
said terminal to which said plurality of distributed constant lines
are connected in parallel is a source of said field effect transistor.

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19. The negative-resistance circuit according to claim 16, wherein:
an output terminal of said negative-resistance circuit is
disposed through a distributed constant line connected to a gate of said field
effect transistor, wherein:

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said negative-resistance circuit comprises:
a bias power source for supplying said gate with a
predetermined DC voltage; and
a resistor connected between said bias power source and said
distributed constant line connected to said gate.

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20. The negative-resistance circuit according to claim 17, wherein:
an output terminal of said negative-resistance circuit is
disposed through a distributed constant line connected to a gate of said field
effect transistor, wherein:

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said negative-resistance circuit comprises:
a bias power source for supplying said gate with a
predetermined DC voltage; and
a resistor connected between said bias power source and said
distributed constant line connected to said gate.

21. The negative-resistance circuit according to claim 18, wherein:
an output terminal of said negative-resistance circuit is
disposed through a distributed constant line connected to a gate of said field
effect transistor, wherein:

5 said negative-resistance circuit comprises:
a bias power source for supplying said gate with a
predetermined DC voltage; and
a resistor connected between said bias power source and said
distributed constant line connected to said gate.

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22. An active filter comprising:
the negative-resistance circuit according to claim 1; and
a resonator connected in series with said negative-resistance
circuit.

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23. An active filter comprising:
the negative-resistance circuit according to claim 4; and
a resonator connected in series with said negative-resistance
circuit.

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24. An active filter comprising:
the negative-resistance circuit according to claim 9; and
a resonator connected in series with said negative-resistance
circuit.

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